Maryland Energy ADMINISTRATION
Powering Maryland's Future

Funding Opportunity Announcement (FOA)

DEMAND RESPONSE & BUILDING AUTOMATION GRANTS

November 2014

I. Background

The Maryland Energy Administration's (MEA) mission is to ensure that clean, affordable, and reliable energy is provided to all Marylanders. MEA provides technical assistance, grant and loan funds, and financial assistance to municipalities, counties, State units, local public agencies, nonprofit organizations, and private entities to establish or carry out sound energy policies and practices.

In February 2014, the State of Maryland convened the Resiliency Through Microgrids Task Force. The Task Force was charged with charting a path forward for resilient energy system deployment in Maryland by studying the statutory, regulatory, financial, and technical barriers to the development of microgrids in the State. A key recommendation of the Task Force was the development of three grant programs to support the commissioning and operation of microgrid projects that will serve critical community assets, while also contributing to the development of a robust, dynamic grid in Maryland.

Today's advanced energy system controls enable business executives, energy managers, and homeowners a variety of options to manage electric load and distributed energy resources economically in response to price signals and overall system performance indicators. In this function, system controls may serve a critical role in balancing the load on a microgrid, while also contributing to the health of the larger electric distribution system. In the case of the distribution grid, a building's system controls respond to signals from the grid by shedding load when electricity is most expensive and carbon intensive, lowering energy costs to the building owner and the public. Both microgrids and the electric distribution grid can use this technology to manage load, directing available power to the critical functions of the system - balancing supply and demand.

FERC Order 745 supported significant growth of demand side resources (DSR), calling on grid operators to offer the full market price for economic demand response and enabling DSR to compete in PJM's real-time and day-ahead markets. Given the uncertain future of FERC Order 745 due to action by the U.S. Court of Appeals, states are presented with a new opportunity to support the development of effective markets for DSR and associated technologies.

Accordingly, MEA hereby announces a funding opportunity and is soliciting proposals for the development of projects that leverage state-of-the-art sensors, communications, power controls, and automation technologies to manage peak demand and lower the energy bills of Marylanders. These projects should feature a systems approach that can quickly receive, interpret, and react to signals from PJM markets and/or the utility in the region. The data collected from this program will be used to inform and educate policymakers and may serve as models to shape future policies, projects, and programs.

Grant recipients will work closely with MEA staff to provide detailed reports that will identify best practices, opportunities, and barriers associated with the development of cost-effective DSR projects. The knowledge gained from these exercises may be incorporated into future solicitations and policy efforts organized by the State. MEA will also showcase successful projects, including through conferences, reports, press releases and other opportunities in order to inform market participants about

the benefits of advanced of advanced load management technology for end-users, the grid, and for microgrids.

For more information please visit http://energy.maryland.gov/Business/drba.html.

II. Program Justification

As defined in this grant, DSR will support the grid of the future by incorporating state-of-the-art communications and control protocols, energy-use data analytics, building automation technology, active end-user energy market participation, improved visibility in building performance, enhanced end-user control, and incorporation of distributed energy resources. In the near term, these technologies and mechanisms will make the electric power grid more resilient and efficient, help to balance load, regulate voltage and frequency, enable the use of more variable distributed energy resources, and empower consumers. In the medium term, these technologies and mechanisms will be incorporated into microgrids that can island from the main grid and sustain critical infrastructure during periods when the larger electric distribution system is down. Under normal operating conditions, microgrids can also contribute to the overall health of the electric distribution system, contributing cost-effective services into many PJM energy and ancillary service markets, thereby increasing the value that distributed energy resources can offer the system.

This RFP seeks proposals to deploy and demonstrate advanced DSR controls in buildings, on campuses, in microgrids or in other applications because they are the critical enabling technology of both demand response and the microgrid. These systems communicate with grid operators which manage load, distributed generation, and energy storage to balance the system. Examples of the components in advanced system controls include, but are not limited to, sensors, direct digital controls, wireless communication protocols, computers, and automated infrastructure or appliances.

In promoting advanced control systems, MEA intends to lower the costs and barriers to these projects, educate Maryland stakeholders on their value, add to the potential "value stack" that these systems can provide as outlined in the *Resiliency Through Microgrids Task Force Report*, and extract lessons that can inform future public policy and program design to further develop demand response markets and microgrid projects.

III. Funding Opportunity

In the interest of enhancing the role of energy system controls, building automation, and DSR in Maryland's energy system, MEA announces up to $2,500,000 in fiscal year 2015 funding for the *Demand Response and Building Automation Grant Program*. MEA may award all or none of the funds for this program. MEA expects awards to be in the range of $100,000-$500,000 per project. MEA also requires the applicant's cost share to be at least 50 percent (including any applicable utility incentives).

MEA will make these awards for innovative projects that offer the best opportunity for wide-scale, cost-effective replication of dynamic energy control projects. The successful projects should lower consumer energy bills and contribute to the economic, resilient and sustainable development of a resilient, dynamic, consumer-friendly electric grid – offering narrative and insight for the energy projects of the future. Preference will be given to projects that advance Maryland's policy goal to deploy technologies

that qualify for both the Renewable Portfolio Standard and reduce per capita electricity consumption in the State.

Eligible projects could include, but are not limited to:

- Innovative and novel building energy management systems;
- Building automation;
- Cooperative DSR projects between multiple parties on a common piece of distribution infrastructure;
- Building intelligence and predicative energy optimization systems;
- Micro-aggregation projects that control multiple small and distributed loads;
- Demand management solutions to minimize peak demand charges;
- Electric vehicle charging and storage automation;
- Communication hardware/software used to interpret and react to real-time grid signals and/or distributed renewable energy variability;
- Microgrids that can participate in PJM demand response markets or utility programs;
- Distributed energy resources used for participating in demand response markets;
- Novel behavioral demand response programs and equipment;

MEA will be looking to target projects that offer novel applications to a variety of DSR market segments, including but not limited to:

- Nursing home and community care
- Education
- Civic
- Office park
- Multifamily housing
- Grocery
- Warehouse
- Retail
- Aggregated single-family residential
- Health care

III. Responsibilities of Grant Recipient

The *Demand Response and Building Automation Grant Program* is an opportunity for the successful applicant to work with the State to identify and promote innovative technologies and business practices that continue the development of a healthy market for DSR. These projects should offer ways to expand "stackable values" associated with demand response, microgrids and building automation, as defined by the *Resiliency Through Microgrids Task Force Report*. Opportunities could include identification of new business models, value streams and system applications. Therefore, the recipients of the pilot program grants should expect to work closely with MEA to report key metrics that characterize the technical, financial, and social performance of the system.

During construction and commissioning, grant recipients will provide monthly reports to MEA. Upon installation of the final product, grant recipients will provide quarterly-annual reports to MEA for a period of two (2) years after commissioning the project. Due to the intended flexibility of this program, required reporting metrics will vary and be outlined by MEA at its discretion dependent on the developer, technology type, host site, and system application.

Examples of possible metrics that will be required during construction and commissioning may include, but is not limited to:

- Detailed historic load profile and baseline of host site;
- Project progress according to the timeline in the proposal;
- Key barriers encountered in project development and how the grant recipient addressed those barriers;
- Best practices that will help to develop future projects;
- Additional information identified by MEA.

Examples of possible metrics that will be required in quarter-annual reports once the project is completed may include, but is not limited to:

- Load shed compared to historic load profile and baseline in kWh;
- Peak energy demand;
- Energy market data, including aggregated market performance and revenues;
- O&M procedures and expenditures;
- Best practices to maximize the value and stackable benefits of the project;
- Situational reports on a selection of DR events within the performance period;
- Ex ante, ex post data demand for a selection of DR events within the performance period;
- Financial performance, including a summary of all revenues realized and costs incurred;
- Additional information identified by MEA.

MEA will provide resources, as available, to assist in the successful development of the project. This could include, but is not limited to technical support, stakeholder engagement, marketing, regulatory engagement, and any other services deemed necessary by MEA.

IV. Timeline

The following timeline applies to the *Demand Response and Building Automation* program:

- MEA must receive applications on or before **12:00 noon, February 19, 2015**.
- MEA expects to notify applicants of their award status by early March 2015. In some cases, applications may be placed on a waiting list in the event that additional funds become available.
- Applicants will be expected to sign a grant agreement by April 1, 2015. Receipt of any grant award is expressly conditioned upon the acceptance of the grant agreement as set forth by MEA, unless MEA determines that any modifications are warranted.
- Equipment for the technology or system(s) must be delivered to the grantee by August 15, 2015.
- The system(s) must be installed and commissioned by December 31, 2015.
- Grantees will need to develop and submit quarterly progress reports during the grant period.
- Grantees will need to develop and submit a final report that summarizes the project's successes, lessons learned, and performance data analysis upon completion of the project.

- Payments will be made on percentage basis, based on the Grantee reaching certain milestones and submitting relevant invoices, as noted below:
    - Equipment delivered to grantee: 40% of award.
    - Technology or system installed and commissioned: 50% of award.
    - One year of performance data and first annual report: 10% of award.

IV. Eligibility Criteria

The following eligibility criteria apply to the *Demand Response and Building Automation* projects*:*

- Eligible applicants include:
    - Maryland residents;
    - Businesses and non-profits which are registered to do business in the State and are in good standing with the Maryland State Department of Assessments and Taxation;
    - Maryland State, County or Municipal agencies;
    - Renewable and clean energy project developers, installers, and financiers;
    - Energy service companies (ESCOs);
    - Investor-owned electric companies, merchant power generators, and other load serving entities within the PJM territory serving Maryland.
- Installed systems must be located in the State of Maryland.
- Systems must comply with all relevant safety and interconnection standards including:
    - IEEE 1547
    - ANSI/NEMA Standard C84.1-2006
- The following costs are **eligible** for *Demand Response and Building Automation Grants*:
    - Direct Digital Controls;
    - Building energy management systems;
    - Networking equipment and software;
    - Required wiring, including installation costs;
    - Communications and control infrastructure;
    - Automated machinery or appliances;
    - Occupancy sensors, photosensors, current sensors, etc.
    - Hardware or software related to the collection and interpretation of energy data, especially in real-time or near-real time;
    - User-friendly interfaces that inform and engage facility occupants in the project;
    - Information technology and communication network security hardware, software or services;
    - Energy storage technologies (up to 1/3 of total MEA grant funding);
    - Any other costs deemed integral to the project's development as determined by the evaluators.
- The following costs are **ineligible** for *Demand Response and Building Automation Grants:*
    - Generation equipment, including but not limited to:
        - Solar PV panels;
        - Wind turbines;

  - Biomass CHP generators;
  - Natural gas CHP generators;
  - Fuel cells;
  - Geothermal heating and cooling systems;
- Ductwork or other HVAC equipment;
- Costs incurred for proposal drafting or submission;
- Land acquisition.

Necessary project costs deemed "ineligible" for grant funding will need to be furnished by the project developer and will be considered as in-kind contributions to the applicant's cost share.

V. Application

Application Format

Please provide the following:

A. A completed *Demand Response & Building Automation Grant Program* FY 2015 Application (attached).

B. A narrative of no more than 15 8½ x 11-inch pages (inclusive of pictures, technical drawings, biographies of key personnel, and spreadsheets), including the following four sections:

1. **Project Description**. This section should include a narrative description of the project, including each of the following:

    a. Project title;
    b. A short summary of the proposed DSR project;
    c. Electrical characterization of project host facility or facilities;
    d. Social characterization of project host facility or facilities;
    e. Load profile of project's host facility or facilities;
    f. Estimated or actual peak load (kW) of all customers to be served by the project;
    g. Maximum anticipated percentage of peak load that will be able to be shed when grid conditions call for it;
    h. Technology specifications and overviews for all major components to be installed;
    i. Layout diagram, one-line diagrams, and any other visual representations of the project;
    j. A description of all network communication equipment, standards, and processes to be leveraged by the proposed project;
    k. Identification of any generation, storage, or other distributed energy resources the project will incorporate;
    l. A project pro forma;
    m. Anticipated project timeline;

n. Legal or regulatory issues that would be addressed during project development and deployment;
o. Expected permitting, interconnection, or inspection issues that might arise;
p. Characteristics of the project that will inform the development of future DSR and building automation projects;
q. An overview of the anticipated market for project replication
r. Expected system payback, including a simple ROI calculation that identifies all assumptions;
s. Methodology for collecting and analyzing 24 months of revenue grade performance data, including PJM market data for the installed system(s) after the project is commissioned;
t. Outline of non-proprietary project information that can be made publicly available or modified for release upon reporting to MEA.

2. **Key Personnel and Corporate Qualifications.** This section should demonstrate the applicant's capacity to execute the proposed project, and include the following information:

    a. Identification of key project personnel;
    b. Key personnel biographies, including relevant experience;
    c. Corporate qualifications and viability, especially pertaining to proposed project viability;
    d. Demonstration of commitment from project partners;
    e. Verification that the applicant is in good standing with the State Department of Assessment and Taxation (SDAT). Status can be verified at the SDAT website at https://sdatcert1.resiusa.org/certificate_net/.

3. **Ownership and Management Structure**

    a. Identification of ownership structure, responsibilities, and privileges of all parties participating in or hosting the project;
    b. First draft of operating and maintenance protocols that will ensure the system will maintain performance and maximize the life of the asset;
    c. An outline of the agreement and compensation method between the project developer, owner, and site host or hosts (if applicable);
    d. Financial letter of intent or financing commitment letter.

4. **Project Budget and Grant Request**

    a. Capital budget, including an itemized table outlining costs and funding sources
        i. Engineering and feasibility studies;
        ii. Permitting, inspections;
        iii. Generation equipment;
        iv. Energy storage equipment;
        v. Project labor;

vi. Project materials.

b. Explanation of the use of grant funding

Application Submission

Please submit your application as an email attachment (as a Microsoft Word document or Adobe PDF) to kyle.haas@maryland.gov. Title of the email should be DRBA GRANT – [Applicant orginzation name] All electronic files sent to MEA must be less than 10 MB in size. While electronic applications are preferred, hardcopy applications will be accepted but they must be received by MEA by 12:00 noon, February 19, 2015. Paper applications should be addressed to:

Kyle Haas, Energy Policy Manager
Maryland Energy Administration
60 West Street, Suite 300
Annapolis, MD 21401

NO APPLICATIONS WILL BE ACCEPTED AFTER NOON, February 19, 2015.

VI. Evaluation

Evaluation Methodology

Demand Response and Building Automation Program will focus on the development of projects that will act as a replicable model. This means successful projects will appropriately balance the goals of resiliency, cost effectiveness, environmental sustainability, and maximum benefit to the State.

MEA expects to offer funding to projects with a variety of sizes, applications, technologies and costs. MEA will assess applications for *Demand Response and Building Automation Program* using the following evaluation criteria:

Threshold Requirements

1. The project must leverage cutting edge demand response technology, especially advanced communication protocols, intelligent building automation systems, direct digital controls, distributed energy resources, etc.
2. The applicant must have a proven track-record of developing successful and cost-effective energy projects that demonstrate experience in DSR, distributed generation or PJM energy markets.
3. Construction cannot have started before date grant is awarded.
4. Applicant must apply for utility incentives, if applicable.

Evaluative Criteria

1. Probability that the project will be successfully commissioned and reliably operated;
2. Ability of the project to significantly participate in demand response markets;
3. Project's capability to receive, interpret, and shed load in response to both economic and

emergency signals from PJM or local Electric Distribution Companies (EDCs);
4. Project's potential to inform and provide model for future economic DSR projects;
5. Successful maximization of end-user engagement and education;
6. Percentage of applicant (and utility) cost-share;
7. Commitment of project developer to work with state entities to identify opportunities and barriers that will result in future projects;
8. Strength and experience of applicant team;
9. Visibility or potential impact of a successful project that could lead other interested parties to invest in similar projects;
10. Strength of annual performance measurement data and life cycle analysis that will be made available to MEA;
11. Applicable market segment;
12. Novelty or innovation of the project.

Evaluation Team

Three to seven qualified staff from MEA and/or other agencies and institutions will form the evaluation team. MEA reserves the right to contact applicants with questions and requests for additional information about the project during the application review period.

VII. Questions

Grant application questions should be submitted via email to Kyle Haas, Energy Policy Manager, at kyle.haas@maryland.gov.